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Communications Consulting Engineers

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FEDERAL COMMUNICATIONS COMMISSION
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MAIL BRANCH

October 23, 1992

Secretary
Federal Communications Commission
Washington, DC 20554

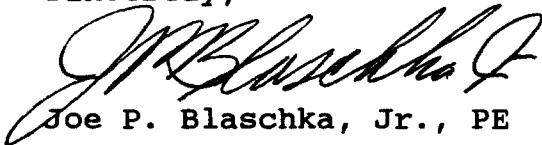
Dear Sir;

Please find enclosed a petition for action on a problem of compatibility between telephone network emergency services and customer premises equipment. This is a matter of public safety and a point of great concern to communications providers and emergency service agencies alike.

An effective solution to problems with compatibility begins with standards, and CFR 47 Part 68 is a logical place to locate them. It is possible that the Commission may find changes are needed in CFR 47 Part 64 as well, but Adcomm is simply suggesting changes to Part 68.

Please give the petition your earliest attention. Thank you.

Sincerely,


Joe P. Blaschka, Jr., PE

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BEFORE THE
Federal Communications Commission

Washington, D.C. 20554

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OCT 28 1992

MAIL BRANCH

In the Matter of

Amendment of the
Commission's Rules to Define
Effective Means for Interworking
of Customer Premise Equipment and
Public Enhanced 9-1-1 Systems

RM - _____

To: The Commission

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OCT 28 1992

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

PETITION FOR RULE MAKING
OF ADCOMM ENGINEERING COMPANY

ADCOMM ENGINEERING COMPANY

Joseph P. Blaschka, Jr., PE

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Kirkland, Washington 98034
206 821-8827

EXPIRES
A Private Party 3/26/93

Dated: October 20, 1992

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EXECUTIVE SUMMARY

I. STATEMENT OF IDENTIFICATION

This petition is filed by Adcomm Engineering Company, an engineering consulting company of Kirkland, Washington, in conference with several public safety agencies in the State of Washington.

Adcomm, these agencies, and others are increasingly concerned by the potential for public harm arising from incompatibility between enhanced (E) 9-1-1 emergency access networks and private, dispersed telephone systems. Few private telephone systems today provide the key to location information that is a vital part of (E) 9-1-1 service, a part that is relied on more every day.

Changes to the Commission's rules and regulations Part 68, while not completely resolving the problem, would streamline efforts to reduce the problem and contain the costs associated with telephone equipment designed to multiple standards. The Commission has shown a willingness in the past to deal with such problems (e.g., controlling the design of cordless phones to reduce spurious 9-1-1 calls).

Possible changes to the rules have been drafted and form a part of this petition. We request that the rules be so considered for modification.

II. OVERVIEW

The Federal Communications Commission has, since the Hush-a-Phone case, ruled that privately beneficial connection to the telephone network was allowable, provided it was not detrimental to the public. This important (and widely copied) philosophy has resulted in the availability to end users of a wide range of affordable technology.

A problem has arisen in incompatibility between FCC registered equipment and the telephone network that impacts the public good. In large part, an effective solution will require changes to the Commission's rules.

Since the 1970s, many things have changed in the telephone network, including the primary concern of this petition, the 9-1-1 emergency access system. An enhanced version of 9-1-1 or (E) 9-1-1 that takes

advantage of the marriage between telephone and computer systems has become widely used. Users have come to depend on the system's ability to provide location data.

III. DISCUSSION

A. The History of 9-1-1 Services

Prior to the 1970s in the United States, emergency callers had a choice of telephone numbers; they could call the local number of their police or fire department or dial "0" to reach a telephone company operator. As the population grew, the patchwork of emergency agencies and telephone numbers became more awkward, resulting in confusion and delays. The telephone companies of the United States and Canada had previously reserved the "service code" or three-digit number 9-1-1 for use as a national emergency number, and it began to see use as a replacement for the old numbers.

Now widely promoted as an easily remembered and dialed number, 9-1-1 has become the accepted emergency access number. Unfortunately, 9-1-1 dialing is not available everywhere in the United States, primarily because of the cost of special network lines and answering equipment for response agencies.

B. Operation of Enhanced 9-1-1 Systems

The original use of the national emergency number has been expanded over time to add features requested by such emergency service providers as fire and police agencies. These features are intended to provide improved speed and caller information that is often the difference in preventing damage and loss of life in emergencies. The term "enhanced" has been applied to this improved capability and has come to mean the availability of three things:

- (1) Routing of 9-1-1 calls to the agency that has jurisdiction on a line-by-line basis regardless of telephone exchange area
- (2) Display of the caller's telephone number (known as automatic number identification or ANI)
- (3) Subsequent display of the caller's address and serving emergency agencies, based on the telephone number (known as automatic location identification or ALI)

The telephone number is the key element in this process because it is used as an index to the other parts (see Figure 1). The telephone number is (1) used to cause routing to the correct public safety answering point (PSAP) and (2) is the key to the data base that provides the address information. If the number is not correct the ALI information will not be correct — this is the heart of the problem addressed by this petition. With private telephone systems, many caller locations can be connected to the public network at a single point and will be associated with that single location, unless distinct numbers are assigned that will reference the location data base correctly.

The situation is illustrated in Figure 2, where a private telephone system with off-premise stations is connected to the public telephone network. Unless a trunk capable of carrying distinct station numbers is provided to the (E) 9-1-1 system and the telephone company's ALI data base is modified to reflect them, all callers from the system will appear as though they were at a single location. Without this trunk the telephone company data base will show a location based on the main calling number of the PBX.

There are two steps that must be taken for the system to work correctly: (1) the data base must be improved to reflect the actual emergency response locations associated with telephone numbers and (2) the private user's actual number or index must be sent to the (E) 9-1-1 system along with the emergency call.

C. Reasons for the Proposed Rule Amendments

1. Enlargement of the Problem

With the recognition that 9-1-1 and (E) 9-1-1 were not available in less populous areas because of the cost of equipment and planning, state and local governments set about establishing the means for funding the spread of the service. This, coupled with the normal modernization that occurs in urban areas, has caused a marked increase in the use of the service and reliance on its features.

The July 31, 1992, issue of the Tacoma News Tribune carried an article of a type that is becoming more common; the article cites the concern that (E) 9-1-1 is not functioning properly with some private phone systems and reveals that the City of Federal Way, Washington, is preparing an ordinance to require compatibility. The article further recalls the

complicity of a private phone system in the recent heart-attack death of a local man for whom medical aid was misdirected.

As citizens have become aware of the location capability of (E) 9-1-1, they have come to rely on it routinely during emergencies where speaking is not possible or prudent. Lifting the phone from the cradle slightly and dialing 9-1-1 without speaking will usually bring a police officer in (E) 9-1-1 areas, prompting the encouragement of this technique in certain emergencies.

2. The Commission's Past Treatment of Problems with CPE

As a regulator of the public telephone network and its interconnects, the FCC has in the past found standard leadership within its charter when nationally-based public network problems became apparent. An example is the recent inclusion of hearing aid standards in CFR 47, Part 68.

Part 68 itself reflects the regulatory concern over proper connection between the public network and a terminal market filled with a variety of vendors and technologies.

3. The Potential for Diversity in Approaches to the Problem

The revelation of this problem and its liabilities to local governments has spurred action in the form of ordinances and laws calling for local demonstration of conformance with (E) 9-1-1 operation. Unfortunately, the products and technologies that would allow many existing systems to conform are not yet in place, resulting in a scramble for solutions among telephone companies, CPE users, equipment vendors, and governments.

A common approach to handling (E) 9-1-1 calls from private switching systems and the associated location information is necessary to prevent a profusion of incompatible solutions. Such diversity would ultimately result in higher costs for many users and offer potential misoperation hazards. The operation of a private switch with an (E) 9-1-1 system is further illustrated in Figure 3.

The FCC could play an important role in providing the focus for a standard at the network interface, including the passing of station automatic number

identification (ANI). The Telecommunications Industry Association's (TIA) TR-41 Committee is also examining the issue and will no doubt be able to provide technical and operating counsel.

1. Proposed Modifications to Part 68, Subpart A — General

§ 68.1 Purpose.

The purpose of the rules and regulations in this part is to provide for uniform standards for the protection of the telephone network from harms caused by the connection of terminal equipment and associated wiring thereto, for the correct operation of terminal equipment with public emergency access networks, and for the compatibility of hearing aids and telephones. . .

§ 68.2 Scope.

. . .the rules and regulations in this part apply to the direct connection:

...
(3) Of all PBX (or similar) systems to private line services for trunk type interfaces, off-premises station lines, automatic identified outward dialing, (E) 9-1-1 emergency services trunks and message registration.
...

§ 68.3 Definitions.

As used in this part:

...
(E) 9-1-1: A telephone network feature that automatically provides emergency response agencies with telephone directory number and location information on calls placed to the national emergency number, 9-1-1.

(E) 9-1-1 compatibility: The ability to pass a station automatic number identification (ANI) that is associated with each served emergency response location.

(E) 9-1-1 emergency services trunk: A 2-wire or 4-wire telephone connection that provides access to (E) 9-1-1 service and is compatible with multifrequency (MF) automatic number identification (ANI) signaling.

Dispersed private telephone system: A PBX or similar system whose connection to the telephone network carries emergency calls from more than one emergency response location.

Emergency response location: A specific site to which emergency response agencies are directed in reaction to notice of an emergency. Subject to local definition.

Ninth-level access: The use of the digit "9" to gain access to a telephone network trunk from a PBX station. Often restricted for certain stations in PBX systems.

Restriction: The blocking of specific dial codes and sequences during call initiation.
...

2. Proposed Modifications to Part 68, Subpart B —
Conditions on Use of Terminal Equipment

§ 68.106 Notification to telephone company.

...
(f) (E) 9-1-1. Customers who intend to connect to E 9-1-1 emergency services trunks shall provide the telephone company with:

- (1) The number of trunk connections desired
 - (2) The number of stations that may originate emergency calls
 - (3) The number of, and names of emergency response locations that will require automatic number identification (ANI)
 - (4) The FCC Registration Number of the equipment being used.
- The telephone company will provide 8-digit numbers for use as ANI for the identified locations.

...

§ 68.114 (E) 9-1-1 compatibility.

Demonstrated compatibility with (E) 9-1-1 shall be required of all registered telephone equipment capable of supporting off-premise telephone stations that may be used for access to public emergency services. Further, access via 9-1-1 shall not be blocked by call restriction features invoked in the CPE nor shall ninth-level access be required to reach the (E) 9-1-1 emergency services trunk.

3. Proposed Modifications to Part 68, Subpart C —
Registration Procedures

...

§ 68.228 (E) 9-1-1 trunk and ANI verification.

(a) Verification requirements.

(1) General. The proper transmission of automatic number identification (ANI) associated with stations dialing telephone company network 9-1-1 shall be verified as part of initial installation and subsequent changes in emergency response location data.

(2) Station ANI. The 8-digit ANI transmitted for 9-1-1 calls shall be verified to:
(i) be in the group of numbers assigned to the trunk by the telephone company and, (ii) be associated with the specific emergency response location of the calling station.

(b) Verification personnel. Work associated with the verification of (E) 9-1-1 emergency services trunk operation shall be performed under the supervision and control of a supervisor as defined in paragraph (c) of this section. The supervisor and installer may be the same person.

(c) Supervision. Work by installation personnel shall be performed under the responsible supervision and control of a person who:

- (1) Has at least 6 months of on-the-job experience in the installation of telephone terminal equipment;

(2) Has been trained in the operation of (E) 9-1-1 emergency services trunks and in the performance of operations needed to verify proper identification procedures and results.

(3) Or, in lieu of paragraphs (c)(1) and (c)(2) of this section, is a licensed professional engineer in the jurisdiction in which the installation is performed.

(d) Verification procedure. The installation supervisor shall provide written notification to the telephone company that the required verification tests have been performed, including the following information:

(1) The responsible supervisor's full name address and business telephone number; and

(2) The date when (E) 9-1-1 trunks will go into service, the date when the verification tests were completed, and a list of trunk identification numbers and station numbers verified.

(e) Verification of changes. Addition or deletion of (E) 9-1-1 data base entries will be cause for verification of operation.

4. Proposed Modifications to Part 68, Subpart D — Conditions for Registration

§ 68.308 Signal power limitations.

[Section (b) table "MAXIMUM ALLOWABLE NET AMPLIFICATION BETWEEN PORTS (A)(B)(E)(F)" should show that (E) 9-1-1 trunks operate with the same requirements as Public Switched Network Ports (2-Wire).]

§ 68.320 (E) 9-1-1 compatibility: technical standards.

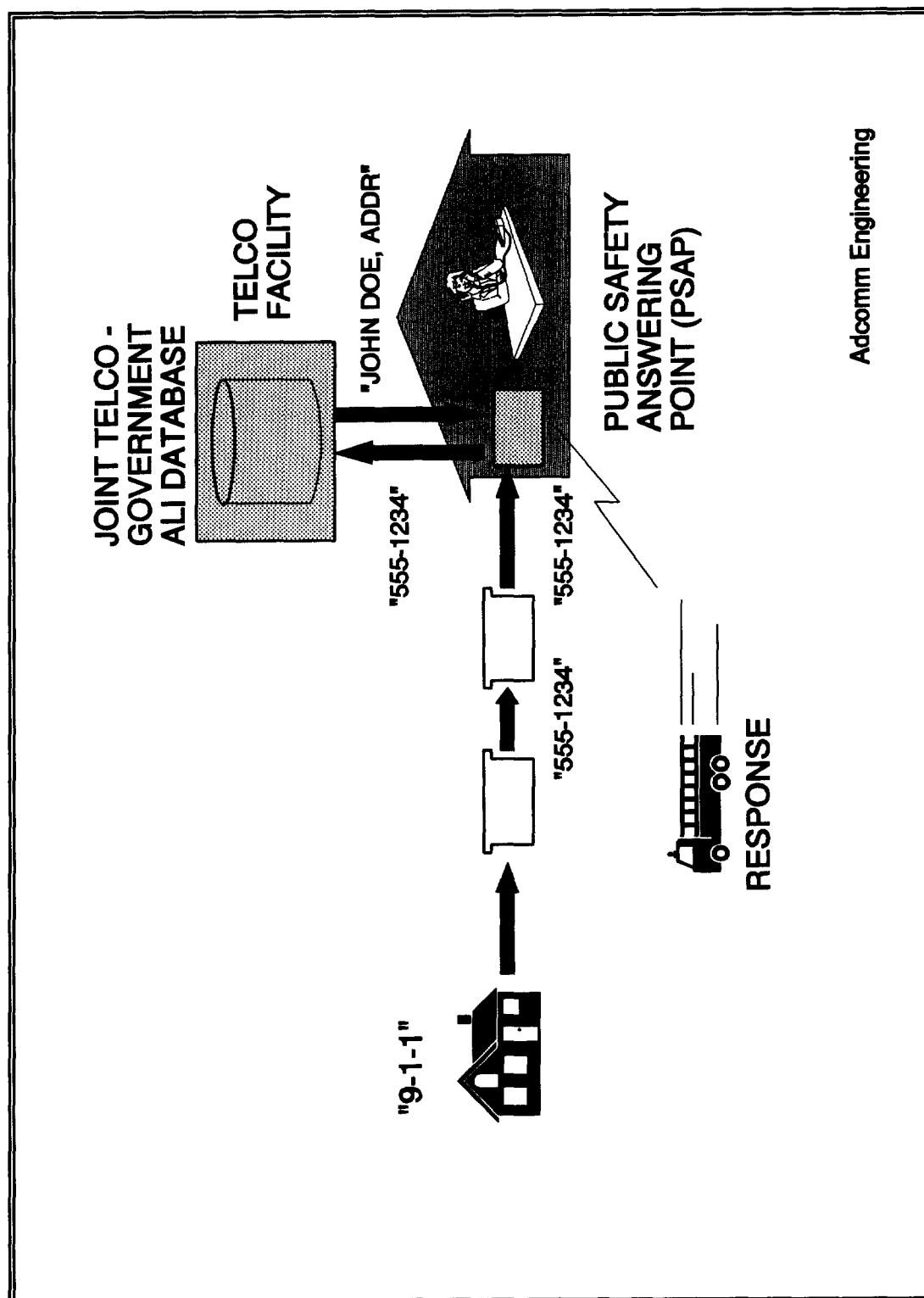
(a) Trunk interface. (E) 9-1-1 trunks are analog two-wire or four-wire channels supporting either E&M type 1 or E&M type 3 signaling.

(b) ANI signaling. The automatic number identification (ANI) code assigned to the emergency response location of a 9-1-1 caller will be sent from the registered equipment to the telephone company (E) 9-1-1 system using North American standard (CCITT System R1) multifrequency (MF) tone pulses, prompted by a solid off-hook indication from the telephone network. Eight-digit codes shall be used.

(c) Industry references. The reference standard for signaling shall be LATA Switching Systems Generic Requirements (LSSGR), Feature Specification Document (FSD) 20-20-000, Section 6, latest revision as published by Bellcore, except as in regard to tone pulse rate, which shall be no higher than 8 per second.

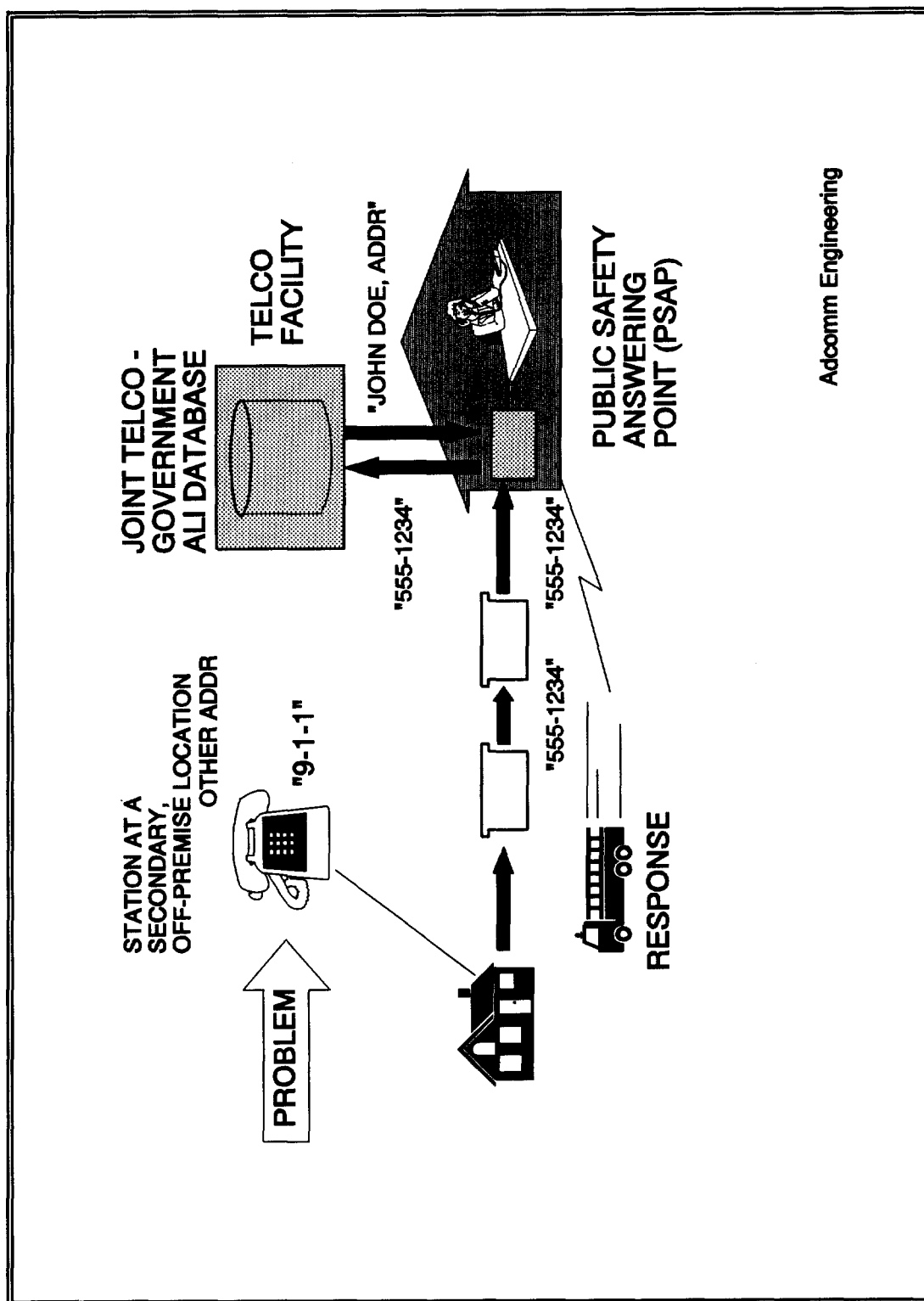
(d) Operability. It shall be possible to access the (E) 9-1-1 trunk in emergencies whether or not system features are used that block access to normal dial trunks (i.e., restriction of all calls beginning with "9"). Access shall be provided whether users dial 9-1-1 or 9-9-1-1.

(e) Equipment levels. The minimum number of (E) 9-1-1 emergency services trunks connecting a private switch to the telephone network shall be one (1). Additional trunks may be used at the user's option. Additional trunks shall be added to maintain an availability of $B = 0.01$ based on the number of users served.



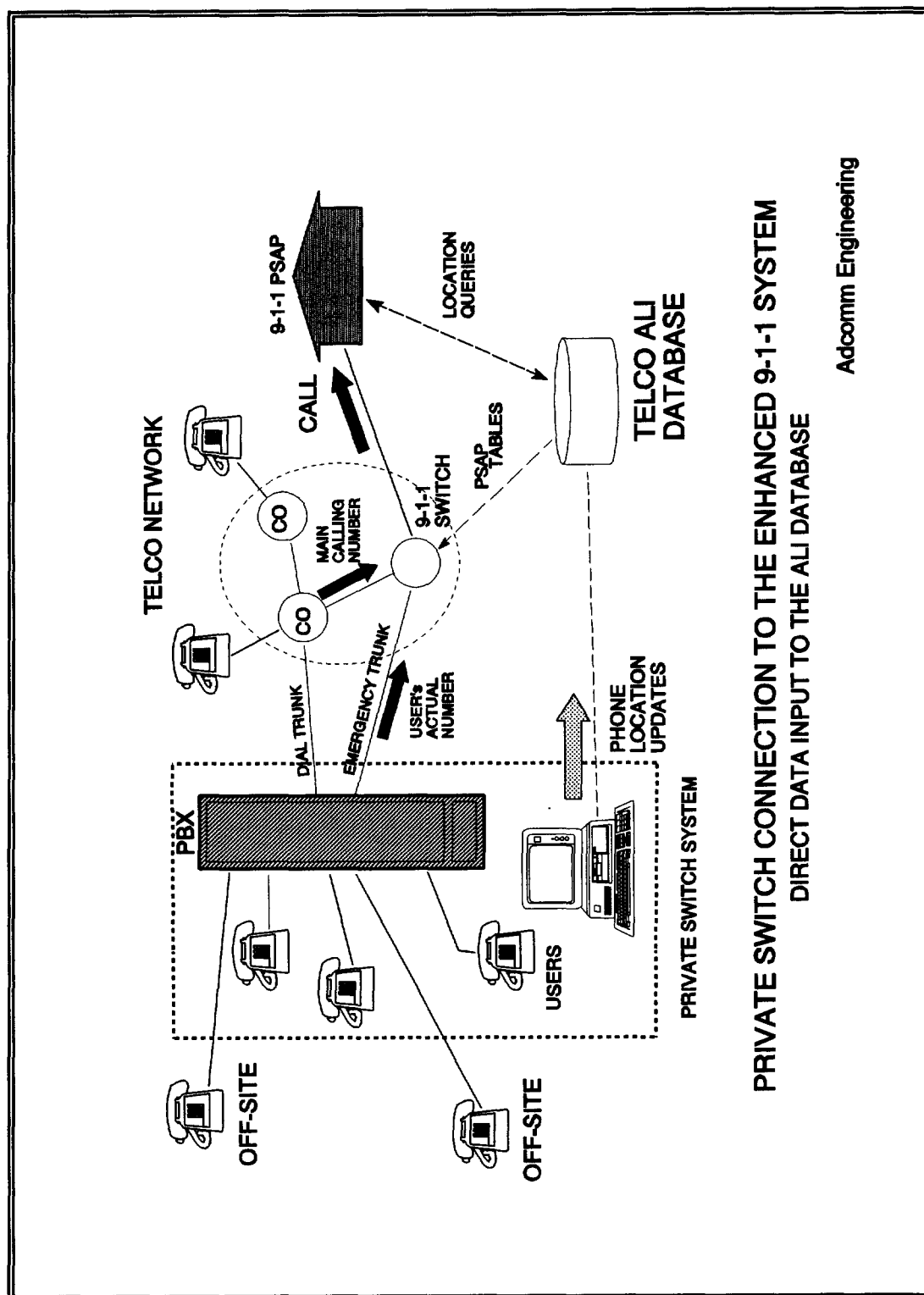
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Figure 1 - (E) 9-1-1 Uses the Caller's Number to Reference a Database for Name and Location Information



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Figure 2 - A Problem Arises When Off-premise Telephones are Used to Dial 9-1-1; Location Data Will Appear Only for the Point of Connection to the Network



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Figure 3 - The Use of Special (E) 9-1-1 Emergency Services Trunks Supported by Database Information from the Private System will Permit Proper Operation of (E) 9-1-1